15:18:35 OCA PAD INITIATION - PROJECT HEADER INFORMATION 11/10/88

Active

Project #: E-24-661 Cost share #: Rev #: 0
Center # : R6631-0A0 Center shr #: OCA file #:
Work type : RES
Contract#: P-7947(8899)-1138 Mod #: Document : SUBCONT
Prime #: DLA900-86-C-2045 Contract entity: GTRC

Subprojects ? : N
Main project #:

Project unit: ISYE Unit code: 02.010.124
Project director(s):
WADSWORTH H M JR ISYE (404)894-2332

Sponsor/division names: BATTELLE /
Sponsor/division codes: 500 / 007

Award period: 881001 to 890301 (performance) 890301 (reports)

Sponsor amount	New this change	Total to date
Contract value	16,000.00	16,000.00
Funded	16,000.00	16,000.00
Cost sharing amount		0.00

Does subcontracting plan apply ?: N

Title: ASSESSING THE EFFECT OF MOOP GEAR ON PERFORMANCE OF SELECTED TASKS

PROJECT ADMINISTRATION DATA

OCA contact: Ina R. Lashley 894-4820

Sponsor technical contact

NANCY BRLETICH
BATTELLE -COLUMBUS DIVISION
505 KING AVENUE
COLUMBUS OH 43201-2693

Sponsor issuing office

BETH GUSTIN
(614)424-4021
BATTELLE - COLUMBUS DIVISION
505 KING AVENUE
COLUMBUS OH 43201-2693

Security class (U,C,S,TS) : U
Defense priority rating : DO-A7
Equipment title vests with: Sponsor
NONE PROPOSED.

ONR resident rep. is ACO (Y/N): N
N/A supplemental sheet
GIT

Administrative comments -
INITIATION OF COST-REIMBURSEMENT SUBCONTRACT UNDER ARMY PRIME. FURTHER SUB
CONTRACTING REQUIRES PRIOR SPONSOR APPROVAL (ARTICLE X. P.6).

GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION

NOTICE OF PROJECT CLOSEOUT

Closeout Notice Date 02/15/90

Project No. E-24-661 Center No. R6631-0A0

Project Director WADSWORTH H M JR School/Lab ISYE

Sponsor BATTELLE/

Contract/Grant No. P-7947(8899)-1138 Contract Entity GTRC

Prime Contract No. DLA900-86-C-2045

Title ASSESSING THE EFFECT OF MOOP GEAR ON PERFORMANCE OF SELECTED TASKS

Effective Completion Date 900912 (Performance) 900912 (Reports)

Closeout Actions Required:	Y/N	Date Submitted
Final Invoice or Copy of Final Invoice	Y	
Final Report of Inventions and/or Subcontracts	Y	900323
Government Property Inventory & Related Certificate	Y	900306
Classified Material Certificate	N	
Release and Assignment	Y	
Other	N	

Comments

Subproject Under Main Project No.

Continues Project No.

Distribution Required:

Project Director	Y
Administrative Network Representative	Y
GTRI Accounting/Grants and Contracts	Y
Procurement/Supply Services	Y
Research Property Managment	Y
Research Security Services	N
Reports Coordinator (OCA)	Y
GTRC	Y
Project File	Y
Other	N
	N

NOTE: Final Patent Questionnaire sent to PDPI.

I. INTRODUCTION

1. Background

This study is a review of the management program of P2NBC2. The study is being conducted as a response to a requirement submitted by Mr. Cunningham and Mr. Gould, U.S. Army Chemical School. The items provided to the Georgia Institute of Technology Study Group to review are as follows:

A. P2NBC2, Physiological and Psychological Effects of the NBC Environment and Sustained Operations on Systems in Combat Program Management Plan dated 25 Oct 1989,

B. P2NBC2 Minutes of the Physiological and Psychological Effects of the NBC Environment and Sustained Operations on Systems in Combat Joint Working Group dated 2 May 1990, 9-10 January 1990, 17 May 1989, 1-2 January 1989,

C. Minutes of the P2NBC2 Modeling Subcommittee Meeting dated 6 and 7 March 1990,

D. Department of the Army Letter of Instruction, undated, and,

E. U.S. Army Combined Arms Combat Developments Activity Transmittal of P2NBC2 Program Plan dated 8 July 1988.

2. Objective

The primary objective of this study is to ensure that the P2NBC2 program is meeting the Department of the Army Charter.

The secondary objective of the study is to make recommendations on any improvements that may be made in the organization, management or structure of the program.

II. APPROACH

1. A detailed analysis of the Department of the Army Letter of Instruction that provides Department of the Army Directed Missions/Objectives for the program. These can be found in Appendix 1.

2. A detailed analysis of the P2NBC2 Joint Working Group minutes and P2NBC2 Program Management Plan that provides the status of the Accomplishment of DA Directed Mission/Objectives. These can be found in Appendix 2.

3. A study of the references provided to determine if the Organization and Members of the various groups follow Army doctrine. The results of this study can be found in Appendices 3 and 4 respectively.

4. A review of the responsibilities for the various organizational levels. These are delineated in Appendix 5.

5. The P2NBC2 Program Management Plan provides the procedure for obtaining the data for the program (see Appendix 6). There is a heavy concentration on field testing and little emphasis on modeling. An opportunity exists to develop models and validate them with the field test so that the model could be used to gain additional data under conditionsfor which tests have not been made.

6. Appendix 7 gives milestone listings for the field testing and modeling of the different Activity Tasks for Fiscal Year 1990 and 1991 respectively.

III. CONCLUSIONS

The following is a list of conclusions and recommendations made with the goal of improving the operation and results of theP2NBC2 Program:

1. The current organizational structure (Appendix 3) from Department of the Army (DA) through the Combined Arms Center (CAC) to the executive agent (Chemical School - CMLS) subscribes to standard army operating policy. The Chemical School, as the executive agent, manages the program for CAC. CAC, as the integrating center, fulfills its responsibility to coordinate the efforts among the TRADOC schools under its direction. CAC, in turn, reports to the Department of the Army.

2. The P2NBC2 Program and the Combined Arms in an NBC Environment (CANE)Program are two separate programs. However, given the similar nature of their research (examination of NBC issues and their effects on the battlefield) a formal tie-in should be established to coordinate their efforts to obtain the most efficient utilization of resources

3. An examination of the program funding levels reveals a dramatic increase from FY89 through FY91 and continued significant funding levels through the program completion in FY95.

FY	89	90	91	92	93	94	95
Program Funding ($1000s)	1305	2207	2262	1830	1593	1488	1450

Funding levels of this magnitude may require that the executive agent be augmented, either with internal resources or outside contractor support, in order to efficiently fulfill its responsibilities as specified in the CAC Program Plan and the DA Letter of Instruction (LOI).

4. The Program Management Plan states (p. 3) "... initially oriented to look at systems operating from the FLOT to the Brigade rear boundary in a European scenario." Given the current state of world affairs, recommend this orientation be shifted to include the MidEast/SW Asia and Latin America (LATAM).

5. As light forces continue to gain in prominence, suggest that more efforts be placed on supporting these forces in an NBC environment.

6. As currently scheduled, the Test Scientific Advisory Group (TSAG) meets just prior (one day) to the Joint Working Group. This does not give the members of the TSAG adequate time to analyze the data prior to making their recommendations to the JWG. Recommend the TSAG meet 30 to 90 days prior to the JWG to remedy this situation.

7. Under the Concept Based Requirements System (CBRS), the operational concept, as embodied in a 525- series document, contains the overall ideas/principles on how the U.S. Army conducts operations in the field. Without this concept, planners have no measure for how well their doctrine, organizations, training plans, and material development fit into the overall concept of how the Army will fight. The Chemical School needs to complete the operational concept to provide direction to the other members of the P2NBC2 program in order to have a coordinated effort.

8. Examination of the Data Source Matrix reveals a very systematic coverage of the primary MOSs that can be expected in the Brigade area. The primary emphasis being on field testing versus modelling.

9. A greater emphasis should be placed on the development of models across the spectrum of tasks. In developing these models, experimental design considerations included in the test plans and executed in field tests will increase the efficiency of the models. This will provide the model developers with useable data without requiring them to extrapolate the test data results across the range of interest. The net result of including experimental design in data collection will be an increase in the efficient use of resources .

Appendix 1: DA Directed Missions/Objectives

1. Develop a Mission Area Threat (MAT) scenario for extensive NBC use during massed Threat offensive and defensive combined arms operations...

2. Assess crew physiological and psychological (P2) response during sustained AirLand Battle (ALB) NBC operations.

3. Determine quantitative performance decrement factors on soldier/crew performance during sustained ALB NBC operations on the integrated battlefield.

4. Determine how crew performance degradation during sustained ALB NBC operations limits systems performance and affects ALB doctrine.

5. Identify near term methods and procedures to increase fightability and habitability of current and future crew served combat vehicle systems.

6. Near Term Countermeasures - Training: provide operational training guidance to all units, centers and schools.

7. Concept Development: subsequent to (1) through (6) above, develop an operational concept, staff it for approval, and publish it in a 525- series pamphlet.

8. Mission Area Analysis (MAA): examine the forces ability to fight and win in consideration of (1) through (7). Provide input to the TRADOC Battlefield Development Plan (BDP) and integrate results into the Mission Area Development Plan (MADP).

9. Long Term Countermeasures: Doctrine, Training, Organization and Materiel deficiencies (LTCM - DOTO &M) will be examined and necessary corrective actions determined and initiated.

Appendix 2: Accomplishment of DA Directed Missions/Objectives

1. "Development of the MAT scenario".
   Not completed. Currently being re-looked in view of the changing world situation and the proliferation of chemical weapons in third world nations.

2. "Assess crew P2 response during sustained ALB operations".
   On-going testing and modelling being conducted to fulfill this aspect of the program.

3. "Determine quantitative decrement performance factors (dpf)".
   The "Human Performance System Program" has been developed to calculate and present these data for use by battlefield commanders. This program needs to be filled-out as there are data gaps in the system.

4. "Affects of crew performance degradation limits system performance".
   On-going testing and modelling is being conducted to fulfill this requirement.

5. "Identify near term fixes for crew served combat vehicle systems".
   * Micro-climate cooling vest
   * NBC overpressurization system
   * Alternate designs for NBC suits and masks
   * Increased hydration tables

6. "Near Term Countermeasures - Training".
   Published FC 50-12 and the test results from completed field tests.

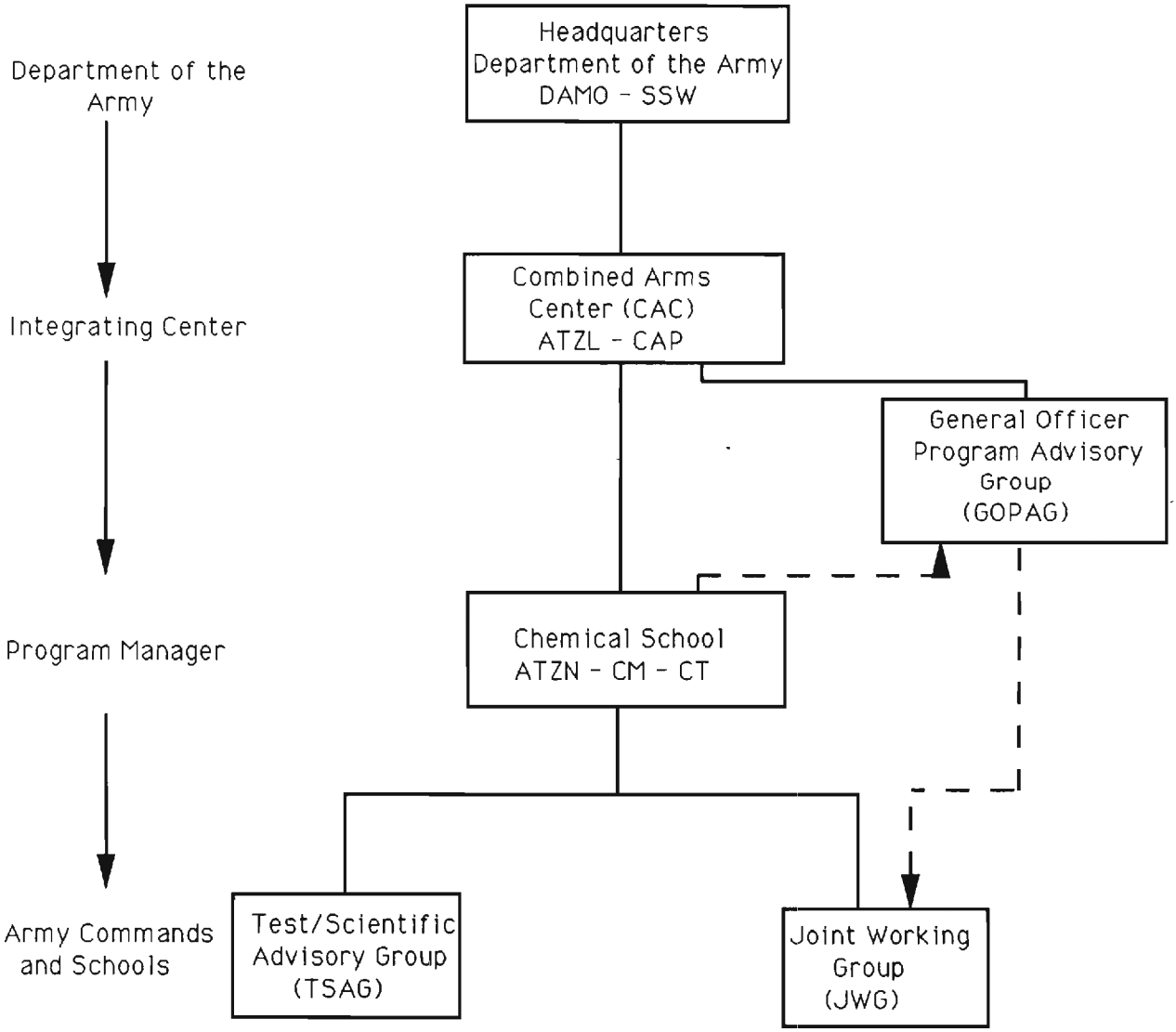
Appendix 2: Accomplishment of DA Directed Missions/Objectives (cont.)

7. "Concept Development".
   Not previously done. Chemical school working on now.

8. "Mission Area Analysis/Mission Area Development Plan/ Battlefield Development Plan integration".
   Results from the P2NBC2 program are integrated into the MAA/MADP/BDP at the JWG, TSAG and other working group meetings.

9. "Long Term Countermeasures".
   Part of test plans and TSAG/JWG meetings.

Appendix 3: Organization



Appendix 4: Members

Headquarters
Department of the Army
DAMO - SSW

Combined Arms
Center (CAC)
ATZL - CAP

General Officer
Program Advisory
Group
(GOPAG)

Chairman — CDR CACDA
Regular Members — CDR USAARMCS
CDR MRDC
CDR USACMLS
GO Rep HQ TRADOC
GO Rep HQ AMC
GO Rep HQ FORSCOM
GO Rep HQ HSC
GO Rep HQ DA
GO Rep ODCSOPS/ ODCSPER

Chemical School
ATZN - CM - CT

Joint Working
Group
(JWG)

Chairman — CDR USACMLS (Executive Agent)
Permanent Members — Chairman TSAG
CACDA Program Manager
DA ODCSOPS DAMO - SSW
HQ AMC
HQ TRADOC ATCD - N
HQ FORSCOM
USA HSC
USA NCA
USA MRDC
USA TEXCOM
USA CRDEC
USA ARMS
USA IS
USA FAS
USA ARENBD

Test/Scientific
Advisory Group
(TSAG)

Chairman — USA MRDC
Permanent Members — USA HSC
USA ARI
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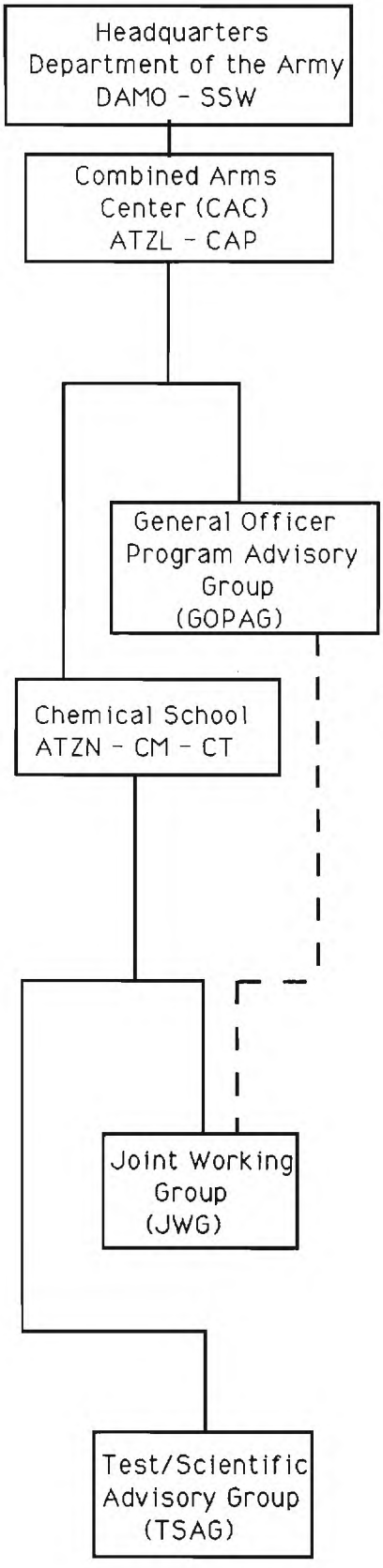
USA ARL
USA CRDEC
USA HEL
BRL
WRAIR
USA ARENBD
USA AVNBD
USA FABD
USA INBD

Appendix 5: Responsibilities



Responsible for **Program Oversight**

Responsible for **Program Management**

Provide overall program direction
Publish program plan
Convene, chair and record PAG meetings
Appoint chairman for TSAG
Staff and approve periodic summary of P2NBC2 findings and provide information in a Field Circular (FC) format
Identify permanent membership of JWG and TSAG
Provide updates to HQDA, TRADOC and other MACOMs

Provides guidance to the JWG
Review and approve JWG prepared test program plan
Review other products of P2NBC2 program

Responsible for **Program Execution**

Proponent and executive agent for P2NBC2
- -convene and chair JWG
- -develop the field test program
- -integrate with CANE and DO49

Develop and publish information periodically
Develop, staff and obtain approval for NBC Mission Area Threat (MAT) scenario
Manage P2NBC2 fiscal resources
Publish specific quantitative performance decrements for MOSs as directed by JWG

Develop research and test priorities, issues and schedules for program activities
Assist the executive agent in developing and coordinating resource requirements for program activities and assemble the field testing program in evaluation plan format (DA Pam 71-3)
Identify those MOSs requiring specific quantitative performance decrement factors to the execuitve agent

Coordinate and advise on laboratory and research efforts in support of JWG objectives
Recommend appropriate changes in analytical methodologies and test designs for P2NBC2 testing to the test proponent. Recommendations forwarded to the JWG

Appendix 6: Data Source Matrix

Proponent System	Field Test	Modelling	Other Test Studies, Analysis
1. Armor			
- M1A1 Tank	P	S	
- M60A3 Tank	P	S	
- M1 Tank	P	S	
- M3 Cavalry Fighting Vehicle	P	S	
2. Aviation			
- AH-64 Helicopter	P	S	
- FARP (includes M977/FARE)	P	S	
- AH-1 Helicopter	P	S	
3. Field Artillery			
- M109 Howitzer	P		S
- Forward Area Ammunition Supply Veh	P		
- Command Post Vehicle	P		
4. Air Defense			
- Pedestal Mounted Stinger	P		
- Missile/Gun System (LOS-F-H)	P		
- Non-Line-Of-Sight (NLOS) Missile System	P		
- Medium SAM (MSAM) System	P		
5. Medical			
- Treatment Team (M577) (BAS/Fwd Suppt Co) (Hvy Div)	P		
- Treatment Team (HMMWV) (BAS/Fwd Suppt Co) (Light Div)	P		
- Air Ambulance Team (UH-60)	P		
6. Ordnance			
- Armored Maintenance Vehicle (AMV)	P		
- M88A1E1 Recovery Vehicle [PIP]	P		
7. Chemical			
- Heavy Division Decon Squad	P		
- Dual Purpose Smoke/Decon Squad (XM56)	P		
- Heavy Division Smoke Squad (M1059)	P		
8. Intelligence			
- Ground Based, Shelter Intercept System (TeamPack, TeamMate, TrailBlazer)			
- Ground Based, Manpack Sensor/ Direction Finding System (REMBASS/MRDFS)			
9. Signal - Mobile Subscriber Equipment	P		S
10. Infantry			
- M113A2 Armored Personnel Carrier	P	S	
- M2 Bradley Fighting Vehicle	P	S	
- M901 Improved TOW Vehicle	P	S	

P= Primary S = Secondary

Appendix 7: Milestones

Field Testing/Modelling

Activity Task FY90	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1. FARP/AH-64 Simulator Test (Avn Sch/HEL)	Date/Location: TBD											
2. M1A1 Rearm Test FOE (CRDEC/TEXCOM ARENBD)												
Pilot Test												
Test	*											
Test Report	(Due: Dec 89)											
3. Tank Target Acquisition Test (USAARMS/ARENBD)												
Pilot Test							*					
Test								*				
Test Report											*	
4. Armor Mobility/CSS Test (USAARMS/TEXCOM ARENBD)												
Test Report			*									
5. Concept Evaluation of 3 vs 4 Man CrewDuring Extended OPerations on the Integrated Battlefield. (USAARMS/TEXCOM ARENBD)												
Pilot Test												*
Test												*
Test Report												(Dec90)
6. NBC Decon Squad OPerations (USACMLS/TEXCOM ARENBD)												
Pilot Test									*			
Test										*		
Test Report												*
7. Upgrade of Test Bed Vehicles in Preparation to Investigate Methods to Enhance/Extend Artillery Crew Survivability & Functionability during Prolonged Operations in an NBC Environment (USAFAS/HEL) [Hereafter referred to as *A1]												

Appendix 7: Milestones (cont.)

Field Testing/Modelling

Activity Task	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY91												
1. Mobile Subscriber Equipment/ Element (Sig Sch/CEBD)												
Pilot Test												
Test												
Test Report												
2. Cavalry Operations during Sustained Operations on the Integrated Battlefield (USAARMS/TEXCOM ARENBD)												
Pilot Test												
Test							*					
Test Report								*				*
3. NBC Mechanized Smoke Squad Operations (USACMLS/TEXCOM ARENBD)												
Pilot Test												
Test												
Test Report												
4. *A1												
FY92												
1. NBC Dual Purpose Smoke Generator/ Decontamination Squad Operations												
Pilot test												
Test												
Test Report												
2. *A1												
FY93												
1. *A1												
FY94												
FY95												

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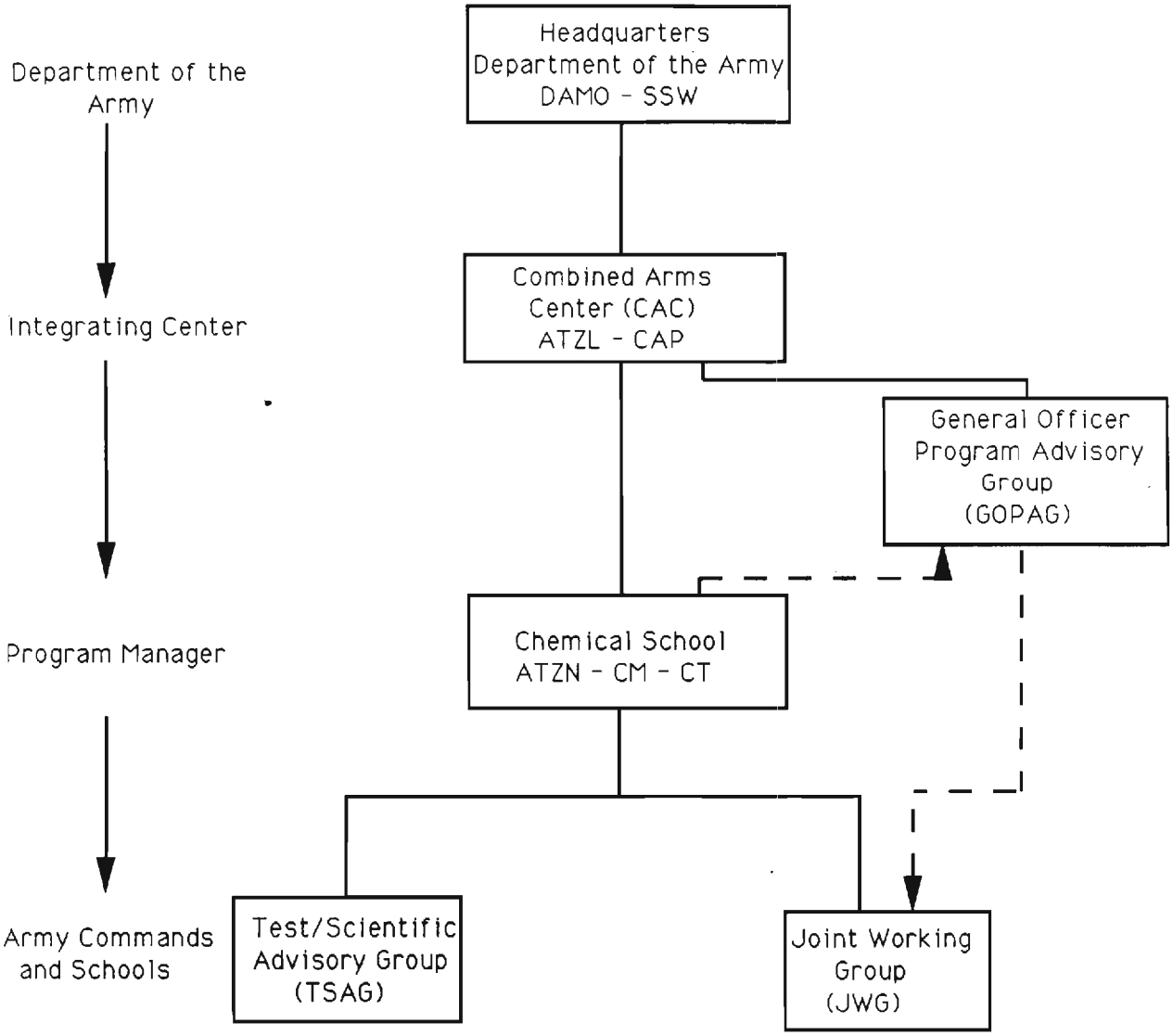

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	GO Rep HQ AMC
	GO Rep HQ FORSCOM
	GO Rep HQ HSC
	GO Rep HQ DA
	GO Rep ODCSOPS/ ODCSPER

Chemical School
ATZN - CM - CT

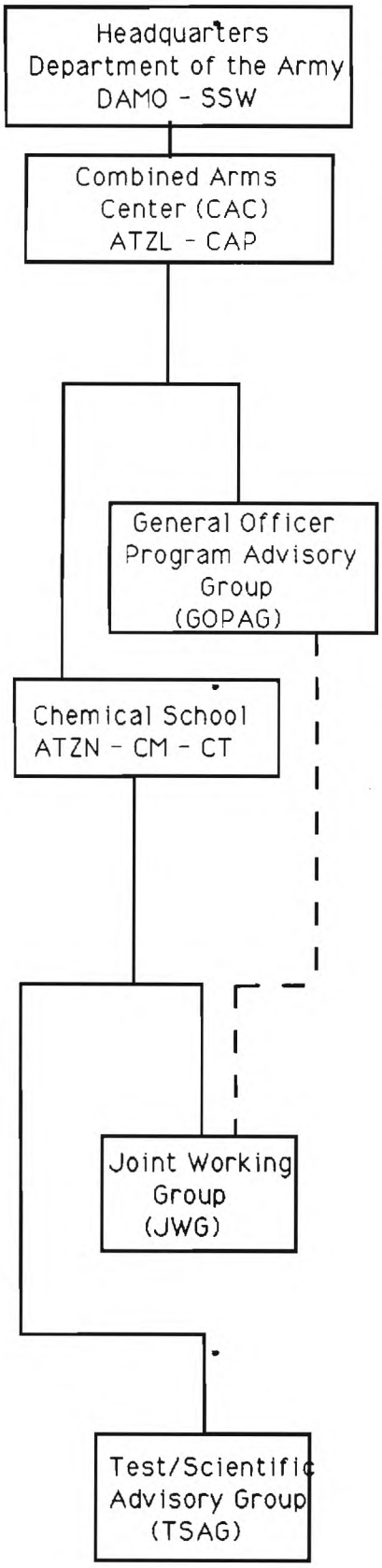
Joint Working
Group
(JWG)

Chairman	CDR USACMLS (Executive Agent)
Permanent Members	Chairman TSAG
	CACDA Program Manager
	DA ODCSOPS DAMO - SSW
	HQ AMC
	HQ TRADOC ATCD - N
	HQ FORSCOM
	USA HSC
	USA NCA
	USA MRDC
	USA TEXCOM
	USA CRDEC
	USA ARMS
	USA IS
	USA FAS
	USA ARENBD

Test/Scientific
Advisory Group
(TSAG)

Chairman	USA MRDC
Permanent Members	USA HSC
	USA ARI
	USA ARIEM
	USA ARL
	USA CRDEC
	USA HEL
	BRL
	WRAIR
	USA ARENBD
	USA AVNBD
	USA FABD
	USA INBD

Appendix 5: Responsibilities



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Staff and approve periodic summary of P2NBC2 findings and provide information in a Field Circular (FC) format
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Provides guidance to the JWG
Review and approve JWG prepared test program plan
Review other products of P2NBC2 program

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Proponent and executive agent for P2NBC2
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- -integrate with CANE and DO49

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Manage P2NBC2 fiscal resources
Publish specific quantitative performance decrements for MOSs as directed by JWG

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Assist the executive agent in developing and coordinating resource requirements for program activities and assemble the field testing program in evaluation plan format (DA Pam 71-3)
Identify those MOSs requiring specific quantitative performance decrement factors to the execuitve agent

Coordinate and advise on laboratory and research efforts in support of JWG objectives
Recommend appropriate changes in analytical methodologies and test designs for P2NBC2 testing to the test proponent. Recommendations forwarded to the JWG

- Dual Purpose Smoke/Decon Squad (XM56) P

Appendix 7: Milestones

Field Testing/Modelling

Activity Task FY90	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1. FARP/AH-64 Simulator Test (Avn Sch/HEL)	Date/Location: TBD											
2. M1A1 Rearm Test FOE (CRDEC/TEXCOM ARENBD)												
Pilot Test												
Test	*											
Test Report	(Due: Dec 89)											
3. Tank Target Acquisition Test (USAARMS/ARENBD)												
Pilot Test							*					
Test								*				
Test Report											*	
4. Armor Mobility/CSS Test (USAARMS/TEXCOM ARENBD)												
Test Report			*									
5. Concept Evaluation of 3 vs 4 Man CrewDuring Extended OPerations on the Integrated Battlefield. (USAARMS/TEXCOM ARENBD)												
Pilot Test												*
Test												*
Test Report												(Dec90)
6. NBC Decon Squad OPerations (USACMLS/TEXCOM ARENBD)												
Pilot Test									*			
Test										*		
Test Report												*
7. Upgrade of Test Bed Vehicles in Preparation to Investigate Methods to Enhance/Extend Artillery Crew Survivability & Functionability during Prolonged Operations in an NBC Environment (USAFAS/HEL) [Hereafter referred to as *A1]												

Appendix 7: Milestones (cont.)

Field Testing/Modelling

Activity Task	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY91												
1. Mobile Subscriber Equipment/ Element (Sig Sch/CEBD)												
Pilot Test												
Test												
Test Report												
2. Cavalry Operations during Sustained Operations on the Integrated Battlefield (USAARMS/TEXCOM ARENBD)												
Pilot Test												
Test							*					
Test Report								*				*
3. NBC Mechanized Smoke Squad Operations (USACMLS/TEXCOM ARENBD)												
Pilot Test												
Test												
Test Report												
4. *A1												
FY92												
1. NBC Dual Purpose Smoke Generator/ Decontamination Squad Operations												
Pilot test												
Test												
Test Report												
2. *A1												
FY93												
1. *A1												
FY94												
FY95												